U.S. DEPARTMENT OF COMMERCE/ National Oceanic and Atmospheric Administration

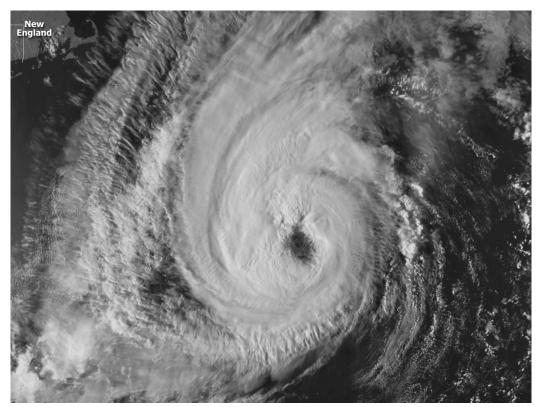


STATES OF AMERICA

OFFICE OF THE FEDERAL COORDINATOR FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

National Hurricane Operations Plan

FCM-P12-2002



Washington, DC May 2002

Hurricane Erin - 11 September 2001

THE FEDERAL COMMITTEE FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH (FCMSSR)

VADM CONRAD C. LAUTENBACHER, JR., USN (RET.)

Chairman, Department of Commerce

VACANT

Office of Science and Technology Policy

DR. RAYMOND MOTHA Department of Agriculture

BRIG GEN JOHN J. KELLY, JR., USAF (RET.)

Department of Commerce

CAPT FRANK GARCIA, USN Department of Defense

DR. ARISTIDES PATRINOS Department of Energy

DR. ROBERT M. HIRSCH Department of the Interior

MR. RALPH BRAIBANTI Department of State

MR. RANDOLPH LYON
Office of Management and Budget

MR. MONTE BELGER Department of Transportation

MR. ROBERT F. SHEA (Acting)
Federal Emergency Management Agency

DR. GHASSEM R. ASRAR National Aeronautics and Space Administration

DR. MARGARET S. LEINEN National Science Foundation

MR. PAUL MISENCIK National Transportation Safety Board

MR. ROY P. ZIMMERMAN U.S. Nuclear Regulatory Commission

MR. HENRY L. LONGEST (Acting) Environmental Protection Agency

MR. SAMUEL P. WILLIAMSON Federal Coordinator

MR. JAMES B. HARRISON, Executive Secretary Office of the Federal Coordinator for Meteorological Services and Supporting Research

THE INTERDEPARTMENTAL COMMITTEE FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH (ICMSSR)

MR. SAMUEL P. WILLIAMSON, Chairman

Federal Coordinator

MR. THOMAS PUTERBAUGH Department of Agriculture

MR. JOHN E. JONES, JR. Department of Commerce

CAPT FRANK GARCIA, USN Department of Defense

MR. RICKEY PETTY Department of Energy

MR. LEWIS T. MOORE Department of the Interior

MR. JEFFREY MACLURE Department of State

MR. DAVID WHATLEY Federal Aviation Administration Department of Transportation DR. JONATHAN M. BERKSON United States Coast Guard Department of Transportation

DR. S. T. RAO

Environmental Protection Agency

MR. JOHN GAMBEL

Federal Emergency Management Agency

DR. RAMESH KAKAR National Aeronautics and Space Administration

DR. JARVIS MOYERS National Science Foundation

MR. DONALD E. EICK

National Transportation Safety Board

MS. LETA A. BROWN

U.S. Nuclear Regulatory Commission

MS. ERIN WUCHTE

Office of Management and Budget

MR. JAMES B. HARRISON, Executive Secretary Office of the Federal Coordinator for Meteorological Services and Supporting Research

FEDERAL COORDINATOR FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

8455 Colesville Road, Suite 1500 Silver Spring, Maryland 20910

NATIONAL HURRICANE OPERATIONS PLAN

FCM-P12-2002

Washington, D.C. May 2002

CHANGE AND REVIEW LOG

Use this page to record changes and notices of reviews.

Change	Page	Date	
Number	Numbers	Posted	Initial
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
	Changes are indicated by a ve change or by shading and strik	rtical line in the margin next to the keouts.	
Review Date	C	Comments	Initial

FOREWORD

The Interdepartmental Hurricane Conference (IHC) is sponsored annually by the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) to provide a forum for the responsible Federal agencies, together with representatives from the user communities like emergency management, to review the Nation's hurricane forecast and warning program and to make recommendations on how to improve the program in the future. The major objective is to plan and prepare for the upcoming hurricane season. The 56th IHC was held in New Orleans, Louisiana, March 11-15, 2002, and the new procedures, procedural changes, and agreements reached at the conference were incorporated into this publication--the 40th edition of the *National Hurricane Operations Plan* (NHOP).

This edition includes a number of revisions and changes. Thirteen action items were addressed during an open meeting of the Working Group for Hurricane and Winter Storms Operations and Research (WG/HWSOR). Eight of the 13 items were closed through incorporation into the NHOP as approved recommendations and/or changes. Of the remaining five, three action items were for information only, one was rejected, and one was non-NHOP related and is being staffed by the WG/HWSOR. The action items will be published in the *Minutes of the 56th Interdepartmental Hurricane Conference*.

Chapter 3, General Operations and Procedures of the National Weather Service Hurricane Centers, contains new policy that directs the National Centers for Environmental Prediction's Hydrological Prediction Center to issue public advisories, vice storm summaries, after subtropical and tropical cyclones have moved inland to cover the threat due to heavy rain and flash flooding. Chapter 3 also includes revised policy on the designation (numbering and naming) of tropical and subtropical cyclones, and a new section on the Hurricane Liaison Team. Chapter 5, Aircraft Reconnaissance, and Chapter 6, Satellite Reconnaissance, were substantially updated, and Appendix A on local National Weather Service (NWS) Products was updated with a new table, indicating how tropical cyclone watch/warning-related products are issued to local users. Appendix G documents a significant revision to the TEMP DROP code.

Similar to the 2000 season, the 2001 season was both active and unusual from the standpoint that the United States experienced no landfalling hurricanes. Tropical Cyclone Allison, however, was a major flooding catastrophe, causing 41 deaths and \$5 billion in damage--the deadliest and costliest U.S. tropical storm on record. Our multiagency tropical cyclone warning support system was put to the test and again superbly responded-a tribute to the professionalism, dedication, and cooperation of the civilian and military agencies involved.

Samuel P. Williamson Federal Coordinator for Meteorological Services and Supporting Research

NATIONAL HURRICANE OPERATIONS PLAN

TABLE OF CONTENTS

		ı	rage
CHANGE AN	D REV	TEW LOG	. ii
FOREWORD			. iii
TABLE OF C	ONTE	NTS	. v
CHAPTER 1	INT	RODUCTION	1-1
	1.1. 1.2.	General	
CHAPTER 2	RES	PONSIBILITIES OF COOPERATING FEDERAL AGENCIES .	2-1
	2.1.	General	
	2.2.	DOC Responsibilities	2-1
	2.3.	DOD Responsibilities	2-4
	2.4.	DOT Responsibilities	2-5
	2.5.	Annual Liaison with Other Nations	2-6
	2.6.	Air Traffic Control/Flight Operations Coordination	2-6
CHAPTER 3		TERAL OPERATIONS AND PROCEDURES OF THE NATIONA ATHER SERVICE HURRICANE CENTERS	
	3.1.	General	3-1
	3.2.	Products	3-1
	3.3.	Designation of Tropical and Subtropical Cyclones	3-5
	3.4.	Transfer of Warning Responsibility	3-6
	3.5.	Alternate Warning Responsibilities	3-11
	3.6.	Abbreviated Communications Headings	
	3.7.	Hurricane Liaison Team (HLT)	
CHAPTER 4	NAT	TIONAL WEATHER SERVICE PRODUCTS FOR THE	
	DEP	ARTMENT OF DEFENSE	4-1
	4.1.	General	4-1
	4.2.	Observations	4-1
	4.3.	Tropical Cyclone Forecast/Advisories	4-1
CHAPTER 5	AIR	CRAFT RECONNAISSANCE	5-1
	5.1.	General	5-1
	5.2.	Responsibilities	5-1
	5.3.	Control of Aircraft	5-3
	5.4.	Reconnaissance Requirements	
	5.5.	Reconnaissance Planning and Flight Notification	
	5.6.	Reconnaissance Effectiveness Criteria	

	5.7.	Aerial Reconnaissance Weather Encoding, Reporting,
		and Coordination
	5.8.	Operational Flight Patterns
	5.9.	Aircraft Reconnaissance Communications 5-26
CHAPTER 6		ELLITE SURVEILLANCE OF TROPICAL AND SUBTROPICAL
		LONES
	6.1.	Satellites 6-1
	6.2.	National Weather Service (NWS) Support 6-5
	6.3.	NESDIS Satellite Analysis Branch (SAB) 6-5
	6.4.	Air Force Support and the Defense Meteorological
		Satellite Program (DMSP) 6-6
	6.5.	Satellites and Satellite Data Availability for the
		Current Hurricane Season 6-9
	6.6.	Current Intensity and Tropical Classification Number 6-13
CHAPTER 7	SURI	FACE RADAR REPORTING
	7.1.	General
	7.2.	The WSR-88D
	7.3.	Procedures
CHAPTER 8	NAT	IONAL DATA BUOY CAPABILITIES AND REQUIREMENTS 8-1
	8.1.	General 8-1
	8.2.	Requests for Drifting Buoy Deployment 8-2
	8.3.	Communications
CHAPTER 9	MAR	INE WEATHER BROADCASTS 9-1
	9.1.	General
	9.2.	Global Maritime Distress and Safety System
		(GMDSS)
	9.3.	Coastal Marine Safety Broadcasts 9-2
	9.4.	High Seas Broadcasts
	9.5.	Additional Information
CHAPTER 10	PUBI	LICITY
	10.1.	
	10.2.	Distribution 10-

APPENDIX A	OFFICE PRODUCTS A-1
APPENDIX B	DEFINING POINTS FOR TROPICAL CYCLONE WATCHS/ WARNINGS
APPENDIX C	JOINT TYPHOON WARNING CENTER (JTWC) BULLETINS C-1
APPENDIX D	FORMAT FOR NHOP/NWSOP FLIGHT INFORMATION FOR INTERNATIONAL AND DOMESTIC NOTAM ISSUANCE D-1
APPENDIX E	SAFFIR-SIMPSON HURRICANE SCALE E-1
APPENDIX F	OFFICIAL INTERAGENCY AGREEMENTS
APPENDIX G	RECCO, HDOB, MINOB, AND TEMP DROP CODES, TABLES, AND REGULATIONS
APPENDIX H	WSR-88D OPERATIONS PLAN FOR TROPICAL CYCLONE EVENTS H-1
APPENDIX I	TELEPHONE AND TELETYPE LISTING I-1
APPENDIX J	PHONETIC PRONUNCIATION LISTING J-1
APPENDIX K	ACRONYMS/ABBREVIATIONS K-1
APPENDIX L	GLOSSARY L-1
APPENDIX M	DISTRIBUTION M-1

LIST OF FIGURES

Figure		Page
1-1.	Tropical cyclone forecast centers' areas of responsibility	1-2
2-1.	Typhoon Nari, September 12, 2001	2-3
4-1.	Tropical cyclone forecast/advisory format	
4-2.	Tropical cyclone public advisory format	4-4
5-1.	WC-130 Weather Reconnaissance Aircraft	5-2
5-2.	G-IV Weather Surveillance Aircraft	5-2
5-3.	NOAA P-3 Weather Surveillance Aircraft	5-3
5-4.	Vortex data message worksheet	5-8
5-5.	Supplementary vortex data message	5-9
5-6.	Example Vortex Data Message (VDM) and Supplementary Vortex Data	
	Message (SVDM) for the WC-130H and WC-130J	5-13
5-7.	NHOP coordinated request for aircraft reconnaissance	5-14
5-8.	Tropical cyclone plan of the day format	5-15
5-9.	Mission evaluation form	5-21
5-10.	Flight pattern ALPHA	5-23
5-11.	Suggested patterns for investigative missions	5-24
5-12.	Schematic of aircraft-to-satellite data link for NOAA P-3 aircraft	5-27
5-13.	Schematic of aircraft-to-satellite data link for AFRC WC-130 aircraft	5-28
6-1.	The GOES satellite system	6-2
6-2.	Center fix data form and message format (satellite)	6-8
8-1.	NDBC moored buoy locations in the Atlantic Ocean, the Gulf of Mexico,	
	and the Great Lakes	8-5
8-2.	NDBC moored buoys in the Pacific Ocean	8-6
8-3.	C-MAN stations in the coastal U.S	8-7
8-4.	NDBC planned and current Gulf of Mexico moored buoy network	8-8
8-5.	Drifting data buoy deployment patterns	
G-1.	Reconnaissance code recording form	G-2
G-2.	HDOB Description and Sample Messages	G-6
G-3.	MinOb Description and Sample Message	
G-4.	Example TEMP DROP Message for Tropical Cyclone Operations	G-15

LIST OF TABLES

Table		Page
3-1.	Atlantic Tropical Cyclone Names	3-7
3-2.	Eastern Pacific Tropical Cyclone Names	3-8
3-3.	Central Pacific Tropical Cyclone Names	3-9
3-4.	International Tropical Cyclone Names for the Western Pacific and	
	South China Sea	. 3-10
5-1.	Requirement for aircraft reconnaissance data	5-6
5-2.	Vortex data message entry explanation	. 5-10
6-1.	Communications headings for satellite tropical weather discussion summaries	6-7
6-2.	Satellite and satellite data availability for the current hurricane season	6-9
6-3.	The empirical relationship between the C.I. number and the maximum	
	wind speed and the relationship between the T-number and the minimum	
	sea-level pressure	. 6-13
7-1.	Participating radar stations	7-2
8-1.	Moored buoy locations and configurations	8-3
8-2.	C-MAN sites	8-4
8-3.	Code forms for moored data buoys, C-MAN stations, and drifting buoys	. 8-10
G-l.	Reconnaissance code tables	. G-3
G-2.	Reconnaissance code regulations	. G-5
G-3.	HDOB Message Format	. G-7
G-4.	NOAA MinOb Message Format	. G-9
G-5.	TEMP DROP code	G-10